***What happens to the area and perimeter of a given geometric shape when you change its dimensions by a scale factor?***

**For this activity you will calculate the perimeter and the area of some basic shapes, then change their sizes by doubling, then tripling, etc. Then calculate each new perimeter and area. Are there any patterns or relationships that we can use to generalize? Show all of your computations and enter your results into the table. (Note: These drawings are not drawn to scale).**

**Stage 1 Rectangles**

3 in.

original

2 in.

**1.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Shape**  **#** | **Scale factor**  **From original dimensions** | **Perimeter** | **Area** |
| **1.** | **1** |  |  |
| **2.** |  |  |  |
| **3.** |  |  |  |
| **4.** |  |  |  |

4 in.

**2.**

6 in.

6 in.

9in.

**3.**

**4. Draw a rectangle 4 times as big as the original rectangle.**

***Now let’s examine the results:***

**How is a scale factor calculated?**

**How is the perimeter changing compared to the original?**

**How is the area changing compared to the original?**

**Stage 2 Triangles. What happens when you change the dimensions of a triangle with different scale factors?**

original

**Area =**

5 in.

4 in.

**Perimeter =**

**1.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Shape**  **#** | **Scale factor**  **from original dimensions** | **Perimeter** | **Area** |
| **1.** | **1** |  |  |
| **2.** |  |  |  |
| **3.** |  |  |  |
| **4.** |  |  |  |

**2. Double the original dimensions and calculate the perimeter and area.**

**3. Triple the original dimensions and calculate the perimeter and area**

**4. Use scale factor of 4 on the dimensions of the original and calculate the perimeter and area.**

**Stage 3 Trapezoids. What about trapezoids? Use this as the original:**

10 in.

6 in.

5 in.

|  |  |  |  |
| --- | --- | --- | --- |
| Shape  # | Scale factor  From original dimensions | Perimeter | Area |
| 1. | **1** |  |  |
| 2. |  |  |  |
| 3. |  |  |  |
| 4. |  |  |  |

**Sketch and calculate the perimeter and areas for at least**

**2 more trapezoids, using a different scale factor for each.**

**Remember, a scale factor multiplies each dimension in the**

**figure by that same amount. Enter results into the table.**

**How is the perimeter changing compared to the original?**

**How is the area changing compared to the original?**

**Perimeter-Area relationships practice exercises.**

**1. Suppose the perimeter of this shape is 26 meters and the area is 48 sq, meters. What will be the area and perimeter if we multiply all dimensions by 4?**

**2. If the area of this figure is**